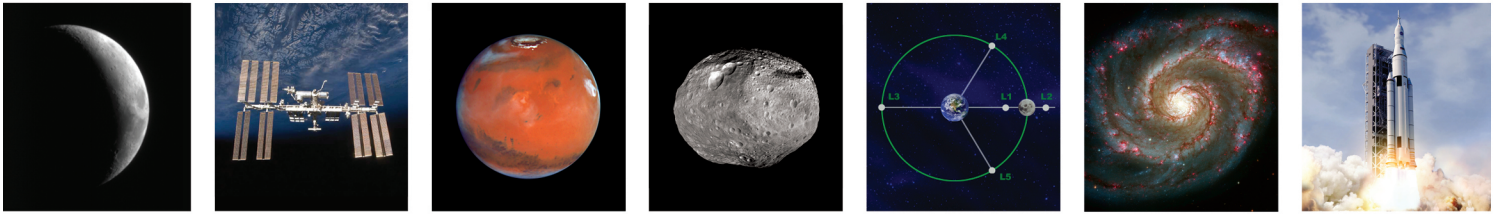




Space Launch System

Highlights

April 2013

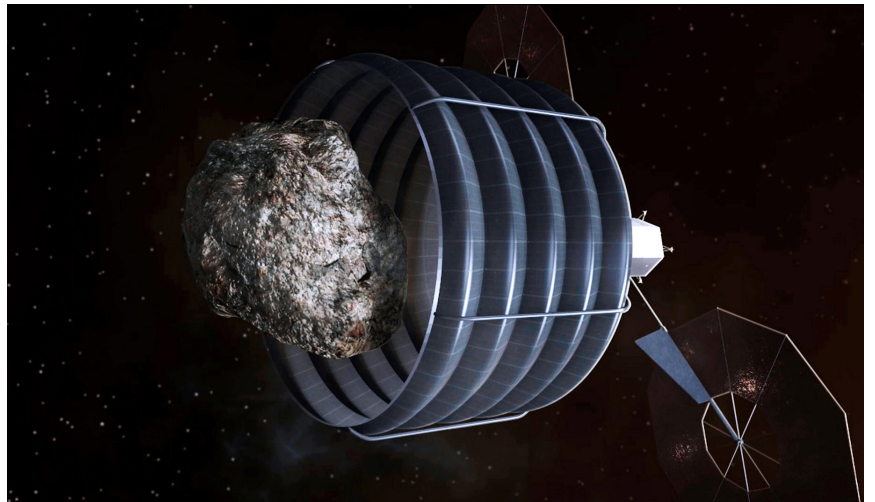


NASA Budget Proposal Lays Out Asteroid Retrieval Mission

On April 10, NASA Administrator Charles Bolden announced President Barack Obama's fiscal year 2014 budget request for the space agency. The proposal includes a plan to robotically capture a small near-Earth asteroid and redirect it safely to a stable orbit in the Earth-moon system where astronauts can visit and explore it.

This mission would use current and developing capabilities to find both large asteroids that pose a possible hazard to Earth and smaller asteroids for examination. According to Bolden, this also helps keep NASA on target to reach the president's goal of sending humans to Mars in the 2030s.

"The president's budget request for NASA for the next fiscal year is a \$17.7 billion investment in our nation's future," Bolden said. "Our budget ensures the United States will remain the world's leader in space exploration and scientific discovery for years to come, while making critical advances in aerospace and aeronautics to benefit the American people."



An artist's rendition of an asteroid capture in progress. The mission was announced during the fiscal year 2014 NASA budget press briefing on April 10. (Image: NASA)

The 77 ton (70 metric ton) version of the SLS will have an unprecedented 8.3 million pounds of thrust off the pad, enabling a larger cargo capacity and faster transit time, making it the viable choice for missions beyond low Earth orbit, including the president's new asteroid mission.

NASA's Associate Administrator for Human Exploration and Operations, William Gerstenmaier, agreed, saying the asteroid mission allows for an integrated approach across the agency to exploration.

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Spaceflight Partners: Avans Machine, Inc.

EDITOR'S NOTE: Every month, SLS Highlights turns the spotlight on one of the industry partners helping to create the largest rocket ever built for human space exploration. In this issue, we profile Avans Machine Inc., of Scottsboro, Ala. — located about midway between Huntsville, Ala., and Chattanooga, Tenn.

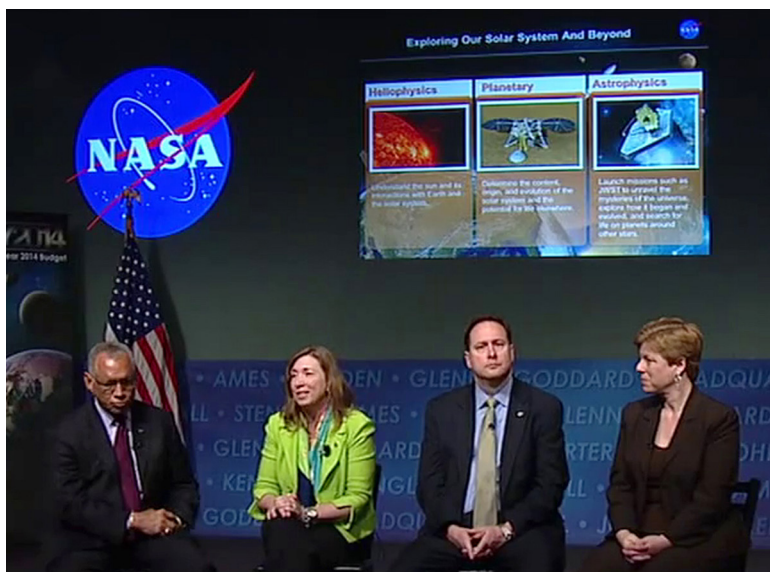
Avans Machine Inc. is a precision machine shop specializing in machining and assembly for various industries, including aerospace. Three years ago, the company partnered with Pratt & Whitney Rocketdyne, or PWR, of Canoga Park, Calif., to provide complex, high-tolerance parts for the main injectors, valves, and oxidizer turbo pumps on the J-2X engine. PWR is the prime contractor building the J-2X engine to power the upper stage of NASA's 143 ton (130 metric ton) Space Launch System, an advanced heavy-lift launch vehicle.

"It's exciting to know we're working on hardware designed to take astronauts farther into space than ever before. Not many people can say that," said Brad Martin, project manager for Avans.



Avans project manager Brad Martin (left) with machinist Don Pack. (Image: Avans Machine, Inc.)

When founded in 1989 as a family owned business, Avans was a father-and-two-son enterprise working in a 1,500-square-foot building. Avans now employs nearly 50 people in 40,000 square feet of space.



NASA Administrator Charles Bolden, left, NASA Deputy Administrator Lori Garver, NASA Associate Administrator Robert Lightfoot, and NASA Chief Financial Officer Elizabeth Robinson, right, present details of the fiscal year 2014 budget request in an agency-wide all hands meeting televised from NASA Headquarters in Washington on Wednesday, April 10. Information about the fiscal year 2014 budget request is available at www.nasa.gov/budget. (Image: NASA)

NASA Budget

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"Along with the scientific research and technology demonstrations happening around the clock on the International Space Station teaching us how humans can live and work in space," Gerstenmaier said, "this mission will give us valuable experience we need in deep space operations to send humans to more distant destinations in the solar system, including Mars. In fiscal year 2014, NASA will begin developing and testing prototype capture mechanisms and concepts for crew interactions with the asteroid."

[Click here](#) for an animated look at the proposed asteroid mission. [Another video](#), released during the budget announcement, highlights the many missions currently underway at NASA.

Hot-Fire Tests Steering the Future of NASA's Space Launch System Engines

Engineers developing NASA's next-generation rocket closed one chapter of testing with the completion of a J-2X engine test series on the A-2 test stand at NASA's Stennis Space Center in Mississippi and will begin a new chapter of full motion testing on test stand A-1. The A-1 stand is designed to allow test conductors to gimbal, or pivot, the J-2X during a live firing and test the range of motion for the engine's flexible parts. When the engine is eventually used in space, that motion will be needed for steering.

The J-2X will drive the second stage of the 143 ton (130 metric ton) heavy-lift version of the Space Launch System, or SLS, which is managed at NASA's Marshall Space Flight Center. The rocket will provide an entirely new capability for human exploration and send humans in NASA's Orion spacecraft into deep space.

J-2X engine 10002 was fired for the last time on the A-2 test stand at Stennis on April 17. This engine set a duration record for J-2X engine firings at Stennis' A-2 test stand on April 4 when it fired for 570 seconds.

The SLS will first launch during Exploration Mission-1 in 2017, a flight test that will send an uncrewed Orion spacecraft around the moon.



A new record for J-2X engine test firings was set on April 4, when the engine was fired for 570 seconds on the A-2 test stand at Stennis. With the completion of the test series on this stand, the engine will now be moved to the A-1 test stand where it will undergo gimbaling tests to ensure it can pivot safely. *(Image: NASA/SSC)*



ATK employees move a segment of qualification motor-1, a full-scale version of a booster for the Space Launch System, at the company's facility in Promontory, Utah. The qualification motor is scheduled to be test-fired in late 2013. *(Image: ATK)*

SLS Boosters Reach Program Milestone

The team designing America's new flagship rocket has successfully completed a major technical review of the vehicle's solid rocket boosters. The boosters' preliminary design review, for the Space Launch System, or SLS, was held at NASA's Marshall Space Flight Center in Huntsville, Ala., and included representatives from the agency and ATK of Promontory, Utah. ATK is the prime contractor for the boosters and the booster avionics system.

The successful review indicates the booster design is on track to support the first flight of the SLS in 2017 and is a significant step toward providing the necessary technical and programmatic information needed for NASA to obtain approval to proceed with development of the rocket.

The SLS booster team can now proceed with the associated activities required to advance the design toward Critical Design Review.

SLS On the Road...

SLS Program Manager Todd May speaks to a sold-out crowd of more than 1,000 people at TEDx in Nashville, Tenn., on April 6. TEDx events are designed to give communities, organizations, and individuals the chance to stimulate dialogue by spreading ideas on the local level. May explained the inception of the Space Launch System Program and NASA's mission for space exploration.

(Image: NASA/MSFC)



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NASA astronaut Kate Rubins talks to a television reporter during NASA Day in Montgomery, Ala., about the new Space Launch System that will take humans to deep space. Representatives from NASA briefed Alabama state officials on the future of the space agency. Students visiting the state Capitol talked with Rubins and had the opportunity to learn more about NASA while viewing a traveling exhibit, which included a decommissioned RS-25 engine. RS-25s from the Space Shuttle Program will be used to drive the core stage of the SLS.

(Image: NASA/MSFC)

SLS on Deck:

- SLS Preliminary Design Review Readiness Assessment
- Spacecraft & Payload Integration Office Preliminary Design Review
- Humans to Mars Summit
- NASA Day in Baton Rouge

